



WEIGHING RISKS: SHORT AND LONG TERM IMPACTS OF CREDIT CONSTRAINTS

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Barrier to development

IN PERU, A RICE FARMER discovers that for US\$50, he can buy a sack of fertilizer and hire day laborers to apply the fertilizer to his field. This small investment will increase his yield and raise farm revenue by US\$200. Yet, the farmer does not make the investment, forgoing the potentially dramatic return relative to the investment.

In the Philippines, a parent suffers an injury that requires her to be hospitalized. Neither she nor her husband, a subsistence corn farmer, has any form of insurance or access to formal credit. To pay hospital bills, the family has to informally mortgage their small plot of land, allowing a moneylender to cultivate the land in return for an advance to pay the hospital. If the family does not pawn their land, they cannot pay their bills. Yet now they face not only the risk of losing land but also are unable to reap the fruits of their labor. They could pull the children from school in order to work in other people's fields so that the family will be able to meet its consumption needs. They could choose instead to reduce family consumption in order to keep the children in school. Either strategy has consequences that could be felt for generations.

Many rural families do not even have the opportunity to raise incomes by investing in improvements such as fertilizer, or to improve their wellbeing through educational attainment. These families lack the necessary cash and also find themselves shut out of the credit market. Yet, even those who could receive loans often choose not to borrow.

BASIS research provides evidence that credit constraints remain a significant barrier to rural development, with immediate negative impacts on agricultural productivity. The findings also show that the negative impacts of credit constraints can extend for generations and affect a household's health and educational attainments, in addition to reducing its ability to accumulate wealth. The research projects described in this brief identify factors that can prevent families from operating in the financial credit market, quantify the extent of the negative impact credit constraints have on productivity, and illustrate both the immediate impact these constraints have on productivity and the long-term consequences to families' wellbeing and opportunities.

Forms of constraint

Credit constrained households under-invest relative to those that do not face constraints, and constrained households cannot realize their full material or economic potential. For policy interventions to be effective, however, it is important to identify the various ways that households are constrained from meeting their need for credit.

The most often cited form of credit constraint is *quantity rationing*. A quantity rationed household is one that is denied access to the credit it needs to carry out a profitable investment. There are cases, however, where families do have access credit but choose not to take out loans and thus forego what

appear to be profitable projects. In some cases, farmers may be able to borrow at attractive interest rates, yet if the lender passes on costs associated with screening clients, monitoring loan portfolios, or enforcing contracts, these added costs may make the loan unprofitable for the farmer. Those who choose not to borrow under these conditions are *transactions cost rationed*. Another farmer may be eligible for a loan yet determines that the risks are too high. The most obvious example of this for farm households is the risk of losing their land that they have put up as collateral. These households are *risk rationed*.

Immediate impact: Inefficiency

From the BASIS project in Peru, we are able to see the frequency of the different types of credit rationing faced by households. We also can begin to quantify the lost productivity.

Farms in the study region of Piura, on Peru's northern coast, tend to be small, with more than three-quarters of the farm area controlled by farmers owning fewer than 10 hectares. All land is individually operated, though not everyone has private property title. The state development bank, which held a monopoly over formal agricultural credit, was closed during Peru's financial liberalization in the early 1990s. A new banking law promoted the establishment of rural banks and the strengthening of municipal banks. These regional banks serve as the primary formal financial intermediaries for small commercial production. A vibrant informal sector still thrives alongside the formal credit sector.

Project data come from a panel of 454 households surveyed in 1997 and 2003. Among other things, the survey sought to identify the percentage of constrained households and the type of constraint they face. Overall, in 1997, 57% of households were credit constrained; this figure fell to 45% in 2003. The percentage of quantity rationed households fell from 64% to 27% over the time period, yet the percentage of households that were risk rationed rose significantly from 18% to 49%. Transactions costs rationed households also rose, from 18% to 24%. (See table 1.)

The government titling program of the late 1990s that sought to provide private titles to all farmers might help explain both the reduction in constrained households *and* the increase in those households that are risk rationed. Since land is the type of collateral most often accepted by formal lenders, more farmers

holding title had access to this credit sector. Yet, precisely because the most important endowment for most rural households is land, many families are reluctant to risk losing it by putting it up as collateral.

Table 1. Frequency and type of credit constraint: Piura, Peru survey

	1997	2003
Constrained households	57%	45%
Of constrained households, those that were...		
... <i>quantity rationed</i>	64%	27%
... <i>risk rationed</i>	18%	49%
... <i>transactions costs rationed</i>	18%	24%

Source: Boucher and Quisumbing 2006.

This reluctance, however, means that the family cannot make the most efficient use of its land. In fact, despite liberalization policies and the titling programs, the percentage of households in the sample without any loans rose from 28% to 42% from 1997 to 2003. Meanwhile, those operating in the informal sector remained about the same, which may be because informal loans, while much less advantageous in terms of interest rates, rarely require land as collateral.

Econometric analysis of farm production and expenditures illustrates the immediate consequences for constrained households. The analysis focused on

Table 2. Production and expenditures for rice farmers

	unconstrained	constrained
output per hectare	US\$1,970	US\$1,036
input per hectare	US\$580	US\$420

Source: Boucher and Quisumbing 2006.

rice farming since this is the most important crop in terms of area and value of production in the household sample (and region overall). We would expect problems for those families whose access to credit is constrained, and the results prove the hypothesis that unconstrained households produce more per hectare

than constrained households, spend more per hectare on inputs, and have higher net revenues per hectare. (See table 2.)

How significant are the problems and what are the consequences for families and the economy? Estimates of what credit constraints mean in terms of lost productivity in the region show the dramatic impact that appropriate policy interventions could have. Alleviating credit constraints would increase the value of production per hectare of a constrained household by 55%, on average. This corresponds to a 27% increase in total value of production in the region.

Long-term impact: Inequity

A research project in the Philippines sought to understand how *past* credit constraints impact human and physical asset portfolios, economic mobility, and wellbeing over the long term. In other words, do the effects of credit constraints in the past persist to the present?

In 2003-2004, researchers resurveyed original respondents from a survey first undertaken in 1984-85 and then again in 1992. Also surveyed were the children of the original respondents who had formed their own households in the region and those who had migrated to urban settings and other rural areas. The project area covers 10 municipalities in southern Bukidnon, and the survey sample comprises 331 respondents who had been interviewed in 1984/85, 261 households formed by children living in the same villages as their parents, and 257 migrants—children who moved from the original villages and are now living in other rural and urban areas.

As with the project in Peru, the Philippines survey attempted to identify the ways in which households were credit constrained, specifically whether quantity or risk rationed. Furthermore, the analysis examined a parent's credit constraints in 1984-85 and how this affected the credit market behavior of that parent and that parent's now-grown children in 2003. Outcomes examined for the parent were current credit market behavior, assets, intergenerational asset transfers and consumption. These same outcomes were analyzed for children, while adding the child's nutritional status and educational attainment. In this way, the analysis could determine long-term effects of credit constraint not only on income and asset accumulation, but also on growth, nutritional values, and education.

Based on the 2003 household survey, the estimate of credit constrained households is 75%. This includes

households that would have wanted to obtain additional credit, as well as those that do not want to borrow more because they are afraid that they would be unable to repay. Because most loans are informal and do not involve collateral, loss of collateral is not the most important consequence of being unable to repay; instead, the danger is being cut off from future loans. The evidence of extensive credit constraint is troubling since the effects of past credit constraints are significant. Findings show that children whose parents were credit constrained in 1984-85 have lower total loan sizes, particularly for farm loans. While the parents who were credit constrained do not have significantly lower total loan sizes, they do have significantly higher consumption loans at present. This is consistent with results for assets and consumption. Assets are significant in children's total loan equations, but not in parents'. Education is more important for parents' loan demand but not children's. Possibly this is due to children's lower asset levels as well as parents' lower schooling levels.

Average adult height was slightly higher for individuals living as children in households that were not credit constrained than for individuals who spent their childhood in credit constrained households. The relationship between childhood nutritional status and adult attained height is much stronger for children that grew up in households that did not face credit constraints. This suggests that the absence of credit constraints allowed these households to make better use of childhood nutritional investments in producing healthy adults. Initial household endowments during childhood, such as the mother's education, mother's height, and levels of consumption per capita played a larger (and significant) role in determining achieved adult stature in households facing credit constraints.

Parents who were credit constrained in the past made significantly lower transfers of land and assets to their children. Also, these parents have significantly lower levels of consumption per adult equivalent compared to those who were not constrained. Children of parents who were credit constrained have significantly lower levels of land and assets, and significantly lower levels of consumption per adult equivalent. While being quantity constrained in the past has persistent impacts for both parent and child households, being risk/quantity rationed only affects child households.

Shocks significantly affect the probability of being risk or quantity rationed, but do not affect being



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quantity rationed alone. Being quantity rationed may be more closely linked to structural factors such as assets and education, while being risk rationed reflects vulnerability to risk. Consumption-smoothing mechanisms may be important for those households that are risk rationed; perhaps they are unable to undertake riskier but higher-return investments, with implications for their children's welfare.

Toward innovations

The BASIS research looked beyond the basic constraint of lack of liquidity and sought to clarify why people might remain outside the formal credit sector even if they seem to have an opportunity to operate in that sector. Our more nuanced definition of credit rationing accounts for different manifestations of credit constraint so that interventions on the demand side of the credit market can be better targeted. The research also created a model that allows for estimating the extent of the drag on the region's economy caused by credit constraints, which conversely illustrates the benefits that can occur if the constraints are addressed.

Credit constraints matter in the short term by preventing households from making the most efficient use of their productive endowments. Credit constraints matter in the long term by limiting households' capacity to accumulate physical and human capital, and limiting the ability to transmit wealth to the next generation. The research in Peru shows that the inability to borrow from formal lenders leads families to not make the short-term resource allocations that could increase farm production. This is a significant drag on overall production, and these immediate losses of productivity lead to long-term problems with family health and social capital. The research in the Philippines reveals that the impact of credit constraints lasts for generations.

Through a deeper understanding of the nature of credit constraints and their

impacts, the benefits of programming that seeks to relax or overcome these constraints becomes more clear. On the demand side, risk can be a powerful factor in reducing credit demand and causing people to forgo profitable investments. Potential innovations to reduce risk include general strengthening of insurance capacity, insurance for lenders (index-based instruments), and insurance extended to borrowers by lenders (micro-health insurance).

There are also problems on the supply side that constrain the credit market. These include incomplete titling and property rights programs, the high cost of foreclosure and resale of collateral assets, and inadequate information flows. Areas for innovation include completing land titling, dedicating resources to property registries, strengthening legal systems, and strengthening credit bureaus.



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